

**New Jersey Department of Environmental Protection
Site Remediation and Waste Management Program
Division of Enforcement, Technical and Financial Support
Hazardous Site Science Element**

M E M O R A N D U M

To: Phil Cole, Case Manager/BCM
From: Jill Monroe, Geologist/BGWPA
Subject: Hess Corporation – Port Reading Refinery, Middlesex County
PI Number: 006148
Document Name (Date): AOC 19 QC Laboratory and AOC 90 Former Drum Compound
RI/RAR (Revised) (January 22, 2018)
NJEMS: RPC000002
Job Number/Activity Code: M25AC700/V65H
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Introduction:

The QC Laboratory “assessed raw and refined components of the HC-PR operations”. Spent materials were discharged to laboratory sinks that drained to four USTs (Tank 1, T1, T2 and T3). An additional UST (T4) was identified as a heating oil UST. Tank 1 and waste sink piping were previously investigated, and Tank 1 was removed in 2013. Additional areas of concern on the property include: 1) AOC 90 – Drum Compound, located at the southeast corner of the paved area, and 2) Buckeye Pipeline valve/manifold and underground petroleum pipelines. No investigation of Buckeye infrastructure was conducted during the SI based on land surface observations and absence of a documented release during the PA.

The AOC 19 - QC Laboratory RI/RA report documents the investigation and removal of four (4) USTs (T1 through T4). The RI/RA report also includes the 2013 UST (Tank 1) and waste piping investigation results and remedial action documentation. Soil sample results, soil boring logs, temporary well ground water data and monitor well ground water data and sample location figures are provided, as well as the limits of excavations for UST removals completed in 2013 and 2015. The document includes the Site Investigation soil sample results from AOC 90 – Drum Compound, and represents the locations of a Buckeye underground petroleum pipeline.

This review will comment on the UST investigation and remedial action, AOC 90-Drum Compound and the Buckeye Pipeline.

Regulatory Compliance Section: Aluminum, manganese, iron and sodium were identified in ground water above GWQS. The document states these COCs are “secondary standards” they do not need to be addressed as part of the remediation.

- The ground water quality standards do not differentiate between primary and secondary standards. Remedial investigations need to provide the information necessary to evaluate whether they are naturally occurring, or related to site operations/releases, historic fill (if present), etc.

Higher concentrations of inorganics may be present in urban area ground water due to impervious surfaces and reduced infiltration of oxygenated rainfall. This can result in more reducing conditions

that increase inorganic mobility. Roadway de-icing is also a source of inorganics, as can fill materials. Reducing conditions and increased inorganic concentrations can also be the result of bacterial consumption of organic contaminants, and if the parameter is associated with the transfer, storage or release of a site's raw materials and/or process waste/wastewaters. This is what the investigation needs to determine.

Where concentrations reflect background/regional conditions, these ground water parameters do not need to be specifically addressed in the RI/RA or a CEA. Where they are strictly historic fill related, they may be documented in a historic fill ground water CEA. Where they are site release or process related, they may be part of a site CEA.

UST T1 through T4, Tank 1 and Waste Piping: The UST investigation shows that the area of UST T2 and T3 had the greatest impacts based on soil sample results, PID measurements, odors, and ground water sample results (TW-T2-5). This area appears to be the source of impacts identified within the excavation area limits shown on Figure 9. The excavation extended to 12' bgs.

MW-4 was installed in the broader T2-T3 excavation area. Excavation appears to have positively affected ground water quality based on 2016-2017 VOC and SVOC data at MW-4 compared to temporary well TW-T2-5 data. A CEA and monitored natural attenuation are proposed to mitigate any residual ground water impacts (benzene and arsenic slightly above GWQS). MW-4 is screened 3-15' bgs, with about 3' of well screen below the total depth of the excavated area (12' bgs).

Field sampling and ground water quality data at MW-4 indicates the following:

PID Concentration: MW-4 headspace PID (November 2017) was 88.7 PPM. This indicates that some organics are still present in the former UST area.

pH: The January and November 2017 pH results are high (11.6 – 11.8 SU). This may reflect impacts from cement grout and/or outer casing/well pad installation or represent ground water pH.

ORP and DO: These measurements are low and reflect reducing conditions. Reducing conditions may be associated with residual organic contamination and bacterial consumption of DO, as well as reduced infiltration due to impervious surfaces.

Low flow sampling: MW-4 was installed within the footprint of T2 (December 2016) after the soil excavation was completed (November 2016) and has been sampled by low flow methods (January 2017, February 2017, November 2017). Low concentrations of benzene and arsenic are identified. Low flow sampling in the backfilled excavation area may not represent ground water quality impacts in the broader remediation area.

Please address the following comments:

1. MW-1 and MW-4 pH: Both MW-1 and MW-4 are casing stickup wells with outer casings. Both wells have elevated pH. They must be assessed for pH influence by cement grout and/or outer casing/well pad installation impacts.

This is typically done by redevelopment with evaluation of pH changes during development. Reductions typically confirm that the pH effect is localized due to cement. If so, the well should be replaced. Alternatively, field sampling data from the June 2016 TW-T2-5 volume average sampling event could be compared to the MW-4 low flow monitor well pH data, or additional TW ground

water samples could be obtained to see if pH was previously elevated. Volume average field sampling data was not located in Appendix D for temporary well sampling.

2. T2 Area Ground Water Sampling: MW-4 has been sampled by low flow methods with the pump intake located in the portion of the well screened in the excavation backfill (12' bgs). Pump intakes were identified as 10' TOC (about 7' bgs) and 12' TOC (about 9' bgs). Additional sampling is requested to determine if 1) sampling method makes a difference at this location and 2) to determine the more conservative sampling method or depth for future sampling.
 - Sampling that represents the area beneath the excavation limits is requested. This would be the interval of 12-15' bgs (14.85-17.85' TOC of current MW-4), which would be in native material where PID impacts were identified (TW-T2-5 boring log). Purging may still influence shallow water zone flow, but the pump intake would be in the interval with field screening impacts.
 - MW-4 should also be sampled by volume average methods to influence a broader area.
 - The most conservative sampling method should be used going forward. Quarterly sampling should be implemented prior to GW RAP to ensure that ground water conditions after excavation have been characterized and are stable/decreasing.
3. Ground Water Elevation Data Table:
 - Provide a depth to ground water and ground water elevation summary table for each sampling event discussed in the RI/RA report, even if only one well was sampled. The table needs to include, at a minimum: Well ID, Top of Casing (TOC) elevation, gauging event date, depth to water TOC, and calculated ground water elevation for each gauging event.
 - The field sampling data sheet for MW-1 (November 29, 2017) identified a pre-pump depth to water of 12.65' TOC. The November 21, 2017 contour map (Figure 4) elevation calculates to a depth to water of 7.17' TOC. Please clarify.
 - Confirm if the QC building slab was fully removed or remains in place (outside of the soil excavation limits and the former tank excavation limits). Local conditions need to be considered in ground water data evaluations and contouring (e.g., recent rainfall; perching units; proximity to subsurface utilities that may enhance drainage; paved areas; infiltration areas; etc.).
4. June 2016 Subsurface Delineation Report: Appendix B provided a figure that showed UST locations and anomalies.
 - Clarify if darker red line on the east side of the figure represents the Buckeye Pipeline. It appears to extend past the point represented on site figures.
 - Confirm what "Anomaly 1" is, and the other anomaly (red area) west of T4. There are at least two "concrete structure" USTs in the UST registration information summarized below (from NJEMS). I don't think it should be assumed this is a utility vault unless a utility is willing to come in and identify it.
5. Well Construction Records: The boring logs for wells do not appear to reflect the subsurface conditions described in the soil boring logs.
6. Form A: Form A documentation uses below ground surface information from the well record as information from TOC. Based on the well construction record and the well survey, make the following corrections to Form A, or resurvey the wells if original AGS casings were cut to be flush mount:

- MW-1: well was screened 3-13' bgs. Casing stickup is 2.9' AGS. Therefore: Total Depth **TOC** is 15.9'; depth to top of screen from TOC is 5.9'.
- MW-2: well was screened 3-13' bgs. Flush mount well – top of casing is 0.36' bgs; total depth **TOC** is 12.64'; depth to top of screen from TOC is 2.64'.
- MW-3: well was screened 3-13' TOC. Flush mount well – top of casing is 0.37' bgs; total depth **TOC** is 12.63'; depth to top of screen from TOC is 2.63'.
- MW-4: well was screened 3-15' bgs. Casing stickup is 2.85' AGS; total depth **TOC** is 17.85'; depth to top of screen from TOC is 5.85'.

AOC 90:

- The SI for AOC 90 is not approved. SI samples do not fully evaluate potential release(s) from this unit based on aerial photos. Obtain soil samples from the south side of the former drum storage area.

1974 aerial photo shows material storage off the edge of the pavement:



The 1977 aerial (below) shows the storage area similarly configured to present day, and the area south of the pavement appears to be unpaved and darkened (see circled area).



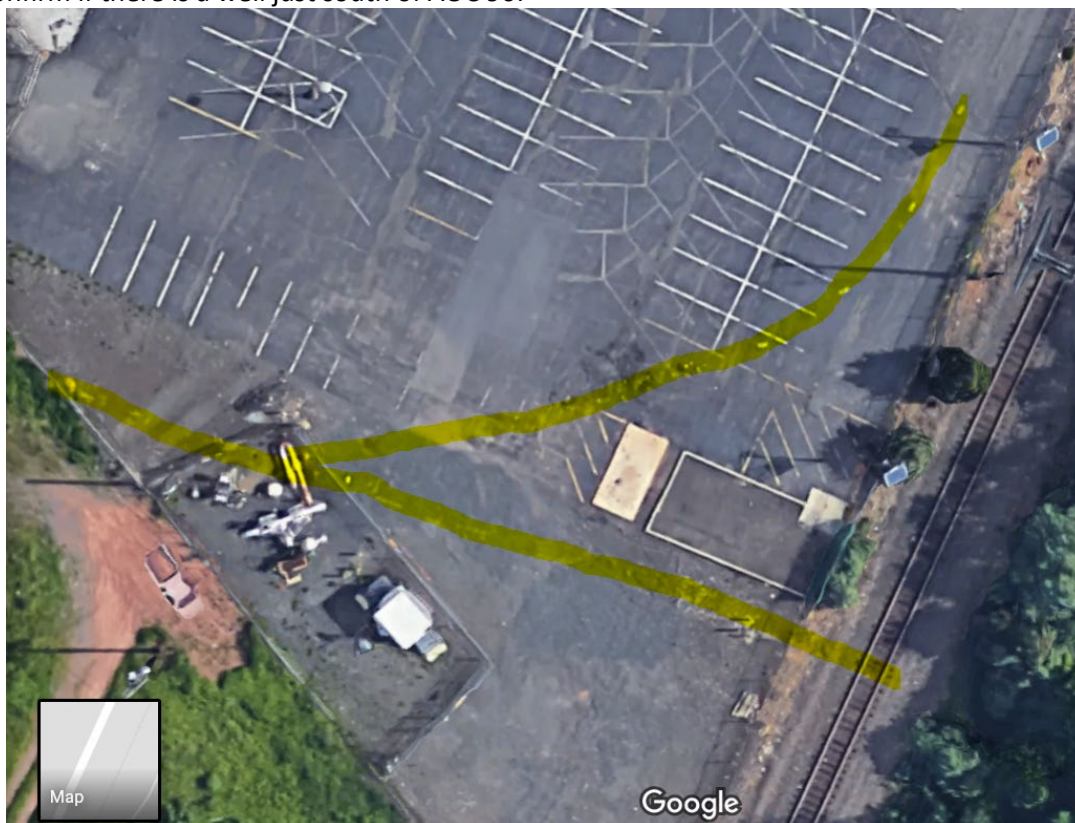
- Based on the January 23, 2017 submittal for a linear construction PBR, soil borings were installed and temporary well data was obtained. The attached Langan figure for the new Buckeye Pipeline connection under PI 745468. SB-25 included a TW ground water sample that identified 3.5 mg/L

SVOC TICs. This information supports AOC 90 investigation to determine if it is a source of ground water contamination at the SB-25 temporary well.

- Confirm if there is, or was, a drainage culvert under the railroad in the area just south of AOC 90.

Buckeye Pipeline Structures (valve/manifold and underground pipelines): Figure 3 shows the Buckeye Pipeline path across the southern portion of the QC Laboratory property and connection to a valve or manifold located at the approximate middle of the southern property line. Figure 3 may represent the actual location of the pipeline or be representational of a pipeline in the area. An extension of the pipeline angles from the valve/manifold toward the eastern edge of the QC property and then parallel to the railroad tracks and northward toward Milos Way. Figure 6.3 shows additional petroleum piping identified as Buckeyes.

- Confirm the location of all Buckeye pipelines, and any other petroleum pipelines (e.g., Williams Pipeline), located within AOC 19 limits. A new pipeline connection between the site and a regional transmission line was completed in 2017.
- The Google Maps satellite view (below) appears to show a piping mark out that reflects the existing Buckeye Pipeline and is slightly different from all RI/RA report figures and closer to AOC 90.
- Confirm if there is a well just south of AOC 90.



- Confirm the status of all underground petroleum piping within AOC 19.
- Provide the invert depth of petroleum pipelines for evaluation as preferential contaminant migration pathways and influence on ground water flow.
- Confirm any ground water impacts at the valve/manifold area.

Other – UST Registration:

To Case Manager: Please evaluate these questions concerning registered USTs at the facility.

There are 6 USTs in the UST registration data base with locations that could not be readily identified at the site. None of these USTs matched the capacity of the USTs removed from AOC 19. BGWPA is not sure if the AOC 19 USTs need to be/need to have been registered.

USTs at the property that are, or are part of, an AOC are as follows:

AOC 6 HW UST: (no tank number?)

AOC 11b Training Center:

UST 0016 (Is UST 00A3 info for 0016? 200 gallons, bare steel tank/piping, unleaded gasoline, abandoned in place)

UST 0017 (no UST registration information for UST 0017 in the NJEMS)

AOC 11a Administration Building:

UST 0012 (550 gallon bare steel tank/piping, unknown use, removed)

UST 0013 (3000 gallon, "other" tank/piping, No. 2 heating oil, removed)

UST 0014 (2000 gallon, "other" tank/piping, No. 2 heating oil, removed)

UST 0015 (Is UST 00A1 info for 0015? 1100 gallons, "other" tank/piping, unknown use, status is "exempt"?)

AOC 15a: UST 0010 (550 gallon bare steel tank/piping, No. 4 heating oil, removed)

UST 0011 (550 gallon bare steel tank/piping, No. 4 heating oil, removed)

AOC 15b: UST 0008 (2000 gallon bare steel tank/piping, No. 6 heating oil, removed)

UST 0009 (100 gallon concrete tank/bare steel piping, Medium Diesel, removed)

AOC 15c: UST 0004 (200 gallon concrete tank/bare steel piping, No. 6 heating oil, removed)

USTs at the property that are NOT an AOC. Locations were not specified in the UST registration data base. AOC 19 UST sizes don't match any of the following registered USTs. Could the concrete tanks be the anomalies identified at AOC 19 geophysical survey?

- UST 001: 550 gallon cathodically protected tank/piping, unleaded gasoline, removed.
- UST 002: 200 gallon concrete tank/bare steel piping, No. 2 heating oil, removed.
- UST 003: 200 gallon concrete tank/bare steel piping, No. 2 heating oil, removed.
- UST 005: 500 gallon bare steel tank/piping, unleaded gasoline, removed.
- UST 006: 22500 gallon concrete structure/piping for water. Status is "exempt"
- UST 007: 7500 gallon concrete structure/piping for water. Status is "exempt"

UST identified at an AOCs that is not in the data base: AOC 11b, UST 0017.

Please call me at 3-1265 if you have any questions on the above.

Attachment

C: Tracy Grabiak (email)
Ann Charles, BEERA